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Test report of

IES LM-79-08

Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Rendered to:

Zhongshan Litian Lighting Co., Ltd.
Block B 4/F, No.2 Yihui NO.2 Road Maohui Industry, Sisha, Henglan Town, Zhongshan City, Guangdong Provice, China 528478

For products:

High Bay Luminaires for Commercial and Industrial Buildings

Models No.:

LT-GK-006-100W-30K

Test Date:	Apr. 6, 2018 to Apr. 11, 2018
Test Item:	Total luminous flux, Luminous Efficacy, Electrical values, Luminous Intensity Distribution, Chromaticity coordinates, CCT and CRI, Spectral Power Distribution.
Test Lab.:	**LCTECH (Zhongshan) Testing Service Co., Ltd** 2/F., Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China Tel:+86-760-22833366 Fax:+86-760-22833399 E-mail:Service@lccert.com http://www.lccert.com
Template No.:	LC-RT-PL/LM79-08/01
Test Note:	

Complied by:	**Reviewed by:**
Bowen Pang	**Richard Li**
Project Engineer	**Technical Manager**
May. 3, 2018	**May. 3, 2018**

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1. General

1.1 Product Information

Brand Name	LI-TIAN LIGHTING
Category	Indoor
General Application	High Bay
Product Type	High Bay Luminaires for Commercial and Industrial Buildings
Model Number	LT-GK-006-100W-30K
Rated Inputs	100-277V, 50/60Hz
Rated Power	100W
Rated Light output	12000lm
Declared CCT	3000K
Power Supply	N/A
LED Package, Array or Module	Model: 2835 0.5W White SMD LED, manufactured by Wincens Optoelectronics (Shenzhen)co.,Ltd
Receipt Samples	1 unit
Sample Code of lab.	180329101013+3000K PCB
Date of Receipt Samples	Mar. 29, 2018
Note	-

1.2 Standards or methods

The following standards are partly or totally used or referenced for test:

No.	Name
ANSI/NEMA/ ANSLG C78.377-2015	Specifications for the Chromaticity of Solid State Lighting Products
ANSI C82.77-2002	Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
CIE Pub. No. 13.3-1995	Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. No. 15:2004	Colorimetry
IES LM-79-08	Electrical and Photometric Measurements of Solid-State Lighting Products

1.3 Equipment list

Instrument	ID	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-923	CHP-500	2018-01-10	2019-01-09
AC Power supply	LC-I-987	APW-110N	2018-01-10	2019-01-09
Power analyzer	LC-I-928	WT210	2018-01-05	2019-01-05
Power analyzer	LC-I-954	WT210	2018-01-10	2019-01-09
Multimeter	LC-I-972	Fluke 17B	2017-08-08	2018-08-07
Photometric colorimetric electric system (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp	LC-PL-I-011	D204C	2017-09-07	2018-09-06
Luminous Flux Standard Lamp	LC-PL-I-003	24V100W	2017-09-22	2018-09-21
Goniophotometer(with mirror)	LC-I-902	GMS2000	2017-05-07	2018-05-06
Wireless temperature transmitter	LC-I-978	DWRF-B	2018-02-11	2019-02-10
Wireless temperature transmitter	LC-I-979	DWRF-B	2018-02-11	2019-02-10

2. Test conducted and method

The luminaire was operated at least 2 hours to reach stabilization and temperature equilibrium before test.

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at 25 °C ± 1°C; the air flow around the sample(s) being tested did not affect the performance.

2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within±0.2 percent under load.

2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

2.4 Electrical Instrumentation

The calibration uncertainties of the instruments for AC voltage and current were less than 0.2 percent, and the calibration uncertainty of the AC power meter was less than 0.5 percent(95 % confidence interval, k=2).

2.5 Color Measurement Method

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the color characteristics (Color rendering index, correlated color temperature, chromaticity coordinate) were calculated from these by software automatically.

2.6 Total Luminous Flux Measurement Method

Total luminous flux was measured by type C goniophotometer system.

Light intensity distribution was measured by a type C goniophotometer (with mirror) which can keep the sample in burn position when the tests conduct, and the total luminous flux was calculated from the intensity data by software automatically.

2.7 Luminous Intensity Distribution Measurement Method

Luminous intensity distribution was measured by a mirror-type goniophotometer (Type C) which can keep the sample in burn position when the tests conduct, and the kinds of graph were generated by software automatically.

2.8 Spatial Non-uniformity of Chromaticity

The customer did not require this measurement.

3. Test Result Summary

3.1 Electrical data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage & Frequency	120.02V~60Hz	120.07V~60Hz
Input Current(A)	0.825	0.822
Total Power(W)	98.83	98.44
Power Factor	0.998	0.998
I-THD	4.17%	-
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	12071.00
Luminaire Efficacy(Lm/W)	-	122.62
Correlated Color Temperature (CCT)(K)	2979	-
Color Rendering Index (CRI)	82.6	-
R9	8	-
Chromaticity Coordinate (x,y)	x=0.4350 y=0.3975	-
Chromaticity Coordinate (u,v)	u=0.2522 v=0.3457	-
Chromaticity Coordinate (u',v')	u'=0.2522 v'=0.5185	-
Duv	-0.00239	-
Zone Lumens between 20-50 °	-	46.70%

3.3 Color Rendering Details

R1	R2	R3	R4	R5	R6	R7	R8
82	93	94	79	82	92	81	58
R9	R10	R11	R12	R13	R14	R15	-
8	84	79	73	86	97	75	-

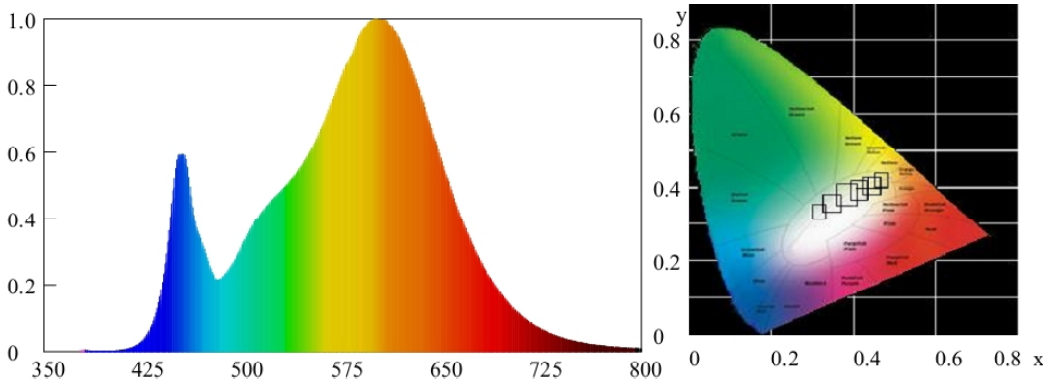
3.4 Additional test at 277V

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage & Frequency	276.97V~60Hz	-
Power Factor	0.964	-
I-THD	8.66%	-

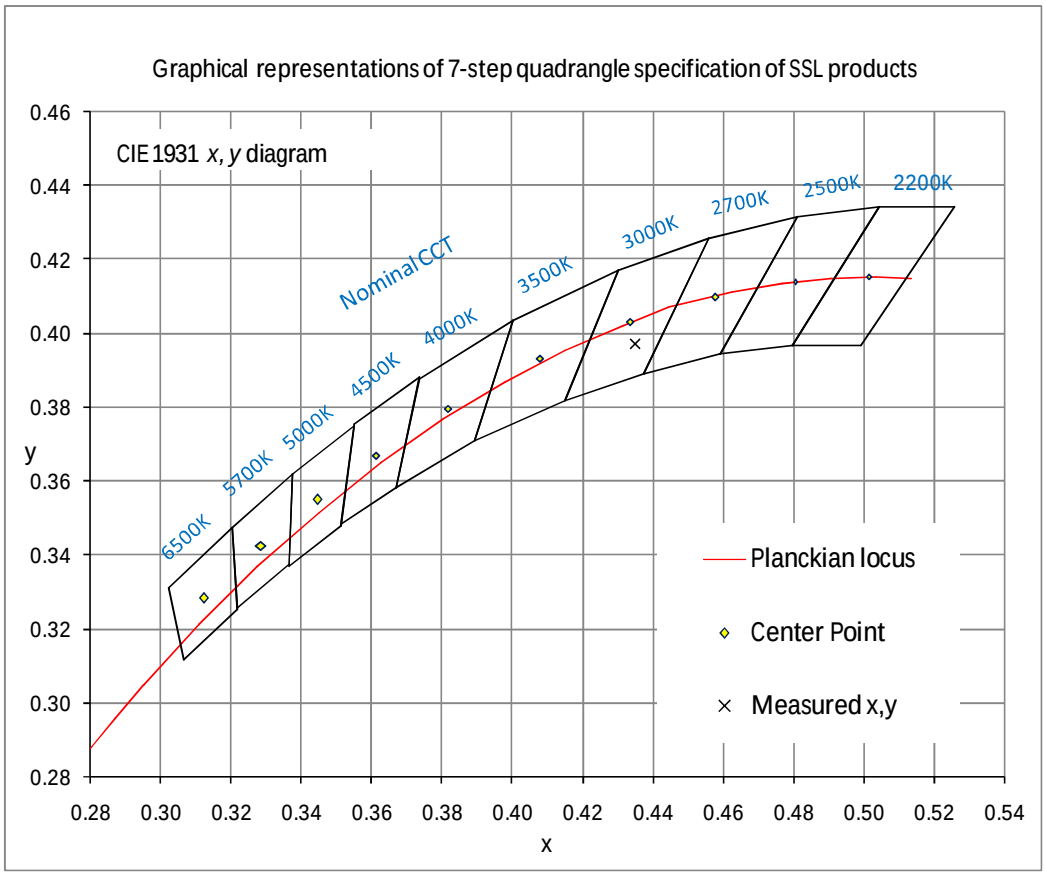
Note: N.A.

4. Test Data

4.1 Spectral Distribution



4.2 ANSI Chromaticity Quadrangles Diagram



4.3 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Rectangular w/Sides
Spacing Criteria (0-180)	1.20	Luminous Length	0.58 m
Spacing Criteria (90-270)	1.30	Luminous Width	0.23 m
Spacing Criteria (Diagonal)	1.36	Luminous Height	0.02 m
Test Distance	29.79 m	-	-

4.4 Zonal Lumen Summary

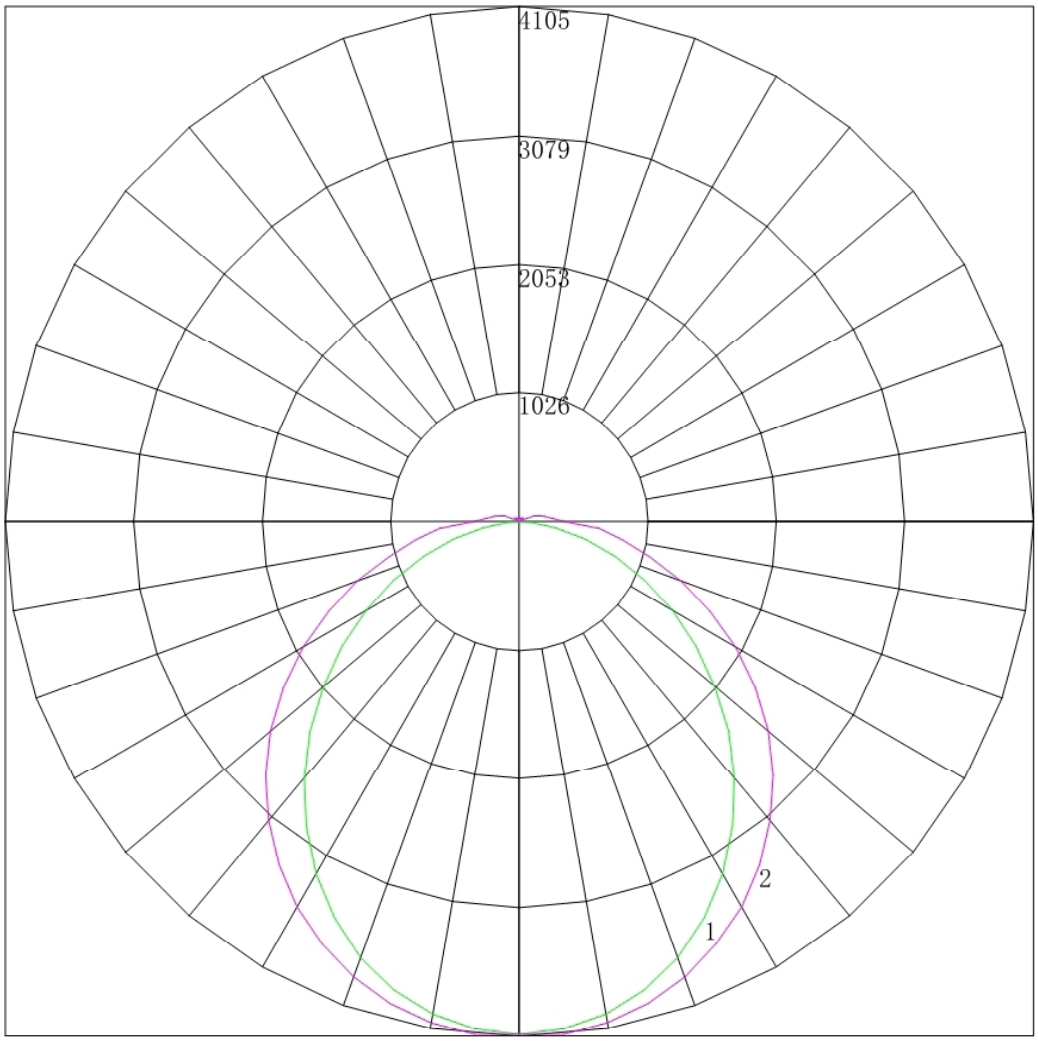
Zone	Lumens	%Lamp	%Fixt
0-20	1489.26	12.30	12.30
0-30	3145.05	26.10	26.10
0-40	5114.35	42.40	42.40
0-60	8933.48	74.00	74.00
0-80	11262.17	93.30	93.30
0-90	11729.25	97.20	97.20
10-90	11342.61	94.00	94.00
20-40	3625.09	30.00	30.00
20-50	5638.75	46.70	46.70
40-70	5228.85	43.30	43.30
60-80	2328.69	19.30	19.30
70-80	918.97	7.60	7.60
80-90	467.08	3.90	3.90
90-110	252.11	2.10	2.10
90-120	273.08	2.30	2.30
90-130	294.94	2.40	2.40
90-150	322.66	2.70	2.70
90-180	341.76	2.80	2.80
110-180	89.65	0.70	0.70
0-180	12071.00	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	386.64
10-20	1102.63
20-30	1655.79
30-40	1969.3
40-50	2013.67
50-60	1805.46
60-70	1409.72
70-80	918.97
80-90	467.08
90-100	169.72
100-110	82.39
110-120	20.96
120-130	21.87
130-140	16.06
140-150	11.66
150-160	9.84
160-170	6.91
170-180	2.35

4.5 Polar Curves



Maximum Candela = 4105.34 Located At Horizontal Angle = 90, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

4.6 Candela Tabulation

	0	15	30	45	60	75	90
0	4088.741	4088.741	4088.741	4088.741	4088.741	4088.741	4088.741
5	4063.853	4064.271	4065.613	4068.350	4070.824	4072.140	4105.340
10	3990.078	3989.748	3998.898	4008.734	4015.755	4023.885	4059.182
15	3866.526	3870.511	3887.261	3906.563	3924.639	3940.443	3980.198
20	3701.644	3708.119	3733.372	3768.926	3800.356	3826.659	3867.957
25	3492.762	3502.791	3545.236	3595.826	3638.693	3676.143	3718.953
30	3247.438	3259.202	3321.519	3386.164	3451.144	3500.848	3551.771
35	2966.115	2991.810	3064.666	3147.242	3229.557	3293.645	3346.458
40	2671.459	2703.952	2788.020	2896.808	2989.610	3065.238	3115.419
45	2363.026	2394.738	2492.917	2619.093	2730.397	2809.127	2866.161
50	2037.704	2076.403	2191.366	2329.631	2447.317	2532.898	2596.663
55	1725.360	1766.901	1890.704	2033.520	2155.607	2249.553	2301.370
60	1406.882	1466.295	1589.041	1740.738	1851.108	1946.522	1993.693
65	1103.471	1168.272	1301.566	1457.519	1574.254	1643.109	1678.029
70	816.459	879.523	1028.234	1178.623	1276.089	1334.161	1373.102
75	542.603	625.567	777.430	907.985	996.067	1047.202	1074.216
80	293.323	406.804	546.019	673.497	762.754	813.444	834.746
85	106.485	209.708	358.594	494.104	574.603	617.511	641.715
90	3.822	66.558	158.182	236.823	291.556	324.812	360.375
95	3.689	28.385	96.515	167.478	220.389	253.117	265.506
100	4.400	9.455	62.468	124.123	170.208	197.800	207.793
105	5.866	9.187	6.738	79.889	130.995	155.344	165.390
110	7.066	9.855	25.107	7.691	44.194	107.301	121.723
115	8.489	9.388	22.416	13.510	8.382	8.544	11.568
120	9.733	10.389	17.257	37.149	16.484	9.584	9.681
125	11.066	12.146	15.545	27.285	44.233	45.683	34.782
130	9.955	13.636	14.144	21.278	31.759	41.748	45.487
135	9.777	13.837	13.721	17.821	23.422	28.886	31.878
140	11.600	14.993	14.855	16.712	20.436	23.575	24.489
145	14.177	16.662	18.903	17.355	19.087	21.073	21.560
150	16.666	17.952	21.571	18.595	19.042	19.768	20.101
155	18.799	18.998	22.572	24.027	20.921	20.741	20.856
160	18.355	19.354	23.951	25.843	26.607	25.811	25.400
165	19.244	20.288	22.928	25.601	26.694	27.801	28.299
170	21.866	22.446	23.017	24.380	26.185	27.006	27.673
175	24.444	24.604	24.573	24.468	24.481	24.747	23.788
180	24.980	24.980	24.980	24.980	24.980	24.980	24.980

Appendix 1 Product Photo

Picture 1

Picture 2

****End of test report****